6020M Controller User manual

Version 1.01

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by

Leadingtouch Technology Co., Ltd
HuiLongGuan LongXiang industrial center,ChangPing,Beijing,China
Tel:+86-51090978 http://www.leadingtouch.com
Fax:+86-51090979 E-mail:info@leadingtouch.com

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1 PRECAUTIONS

Touchscreen is made of glass material. It's easily breakable from dropping or impact, please handle it with care.

Please pull the plug and contact the sales dealer immediately when you smell a bit of unpleasant odor out of touchscreen.

Please do not plug-in and plug-out frequently when the computer is on.

Please clean the front and rear surface of touchscreen in order to make it best performance.

Please do not screw it tight when mounting the touchscreen (i.e. it is desirably fixed up) for fear of deformation.

Please contact the sales dealer if there are not adequate components to your touchscreen.

New touch screen system comprising of: package contents including touchscreen and PC connection cables, control card, quality-assured card, installation disc including driver and manual.

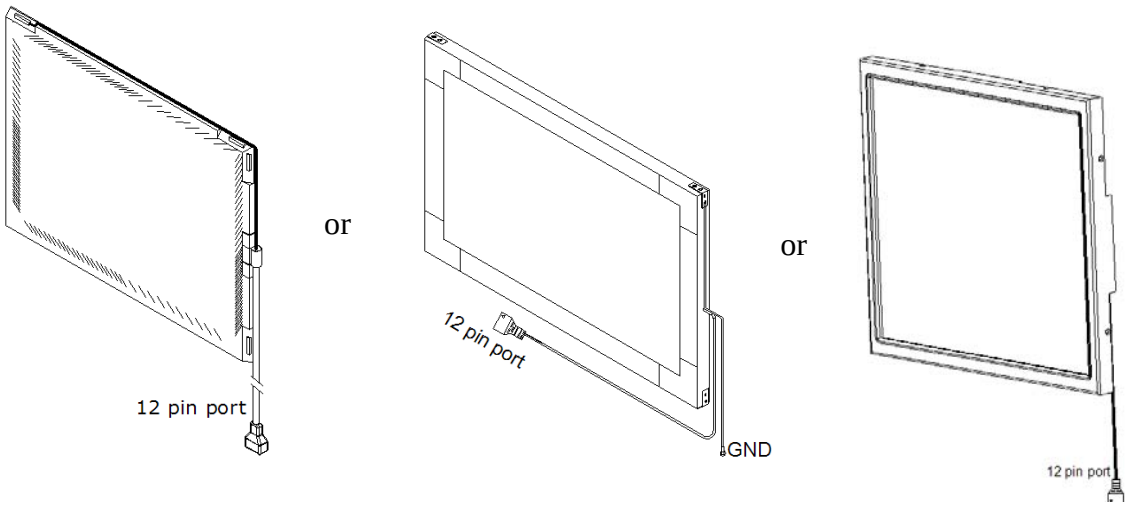
2 Package contents

Touchscreen

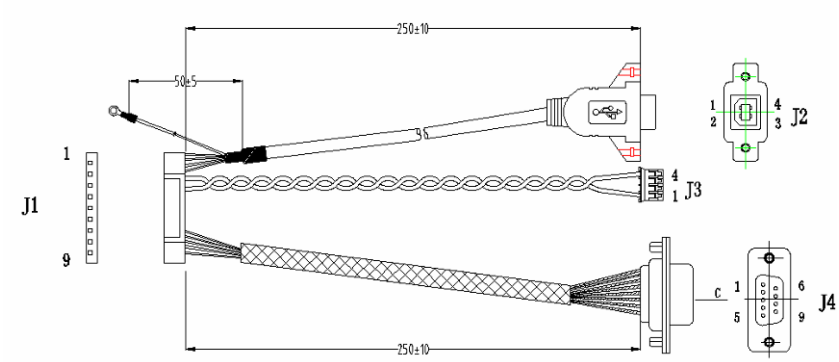
PC connection cables

Control card

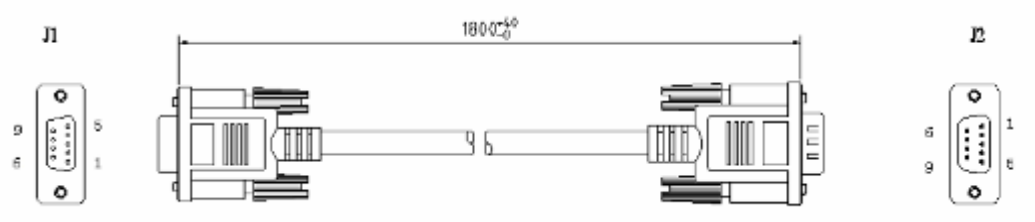
(USB, serial or Comb cable, depending on the model you chose)



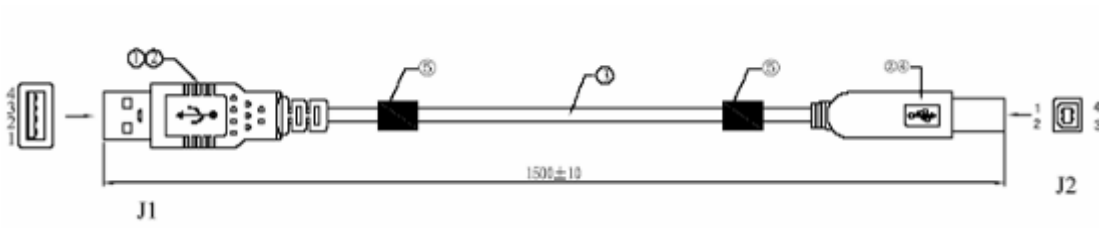
Touchsceen



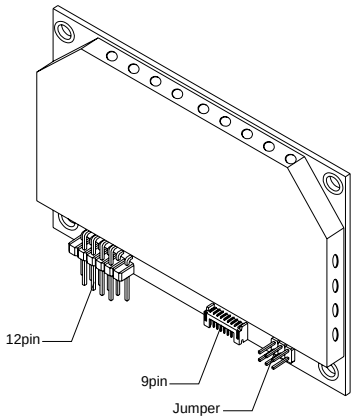
Dual connector cable 14-835-025



Serial extending cable 14-113-180



USB extending cable 14-219-150



Control card 6020M

3 Installing and connecting

Mount touchscreen on monitor and then connect it to PC with cable and control card as following steps

Serial cable connecting

1 · Connect touchscreen 12pin port to 12pin connector of control card.

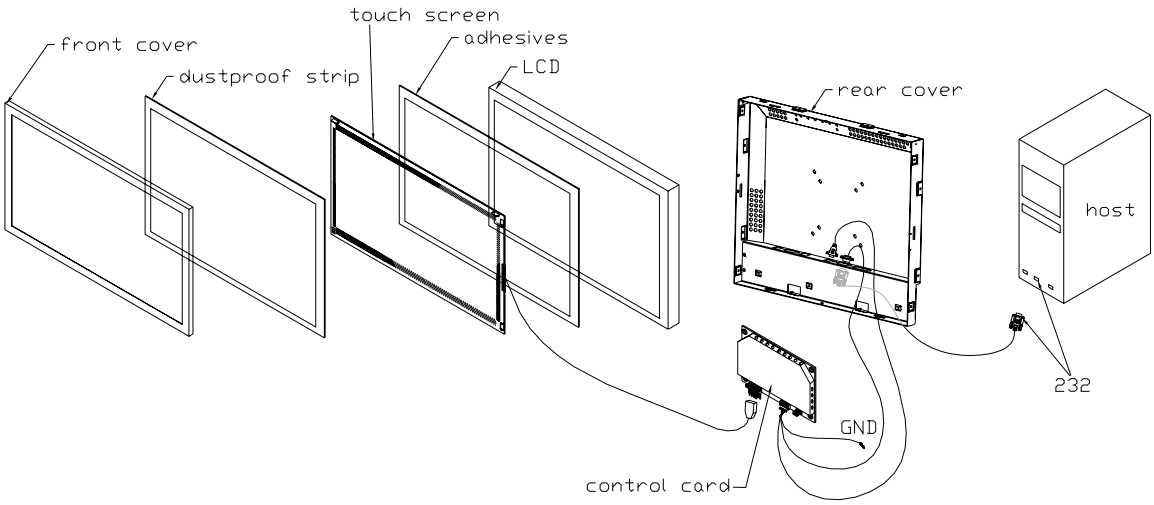
2 · Connect dual connector cable 14-835-025 12 pin connector to 12pin connector of control card.

3 · Connect serial extending cable 14-113-180 DB9 male connector to DB9 female connector of dual connector cable 14-835-025.

4 · Connect serial extending cable 14-113-180 DB9 male connector to PC DB9 female port.

5. Connect dual connector cable 14-835-025 4pin connector to 5V power supply

6. Connect dual connector cable 14-835-025 GND connector to ground



232 cable connecting

USB cable connecting

1 · Connect touchscreen 12pin port to 12pin connector of control card.

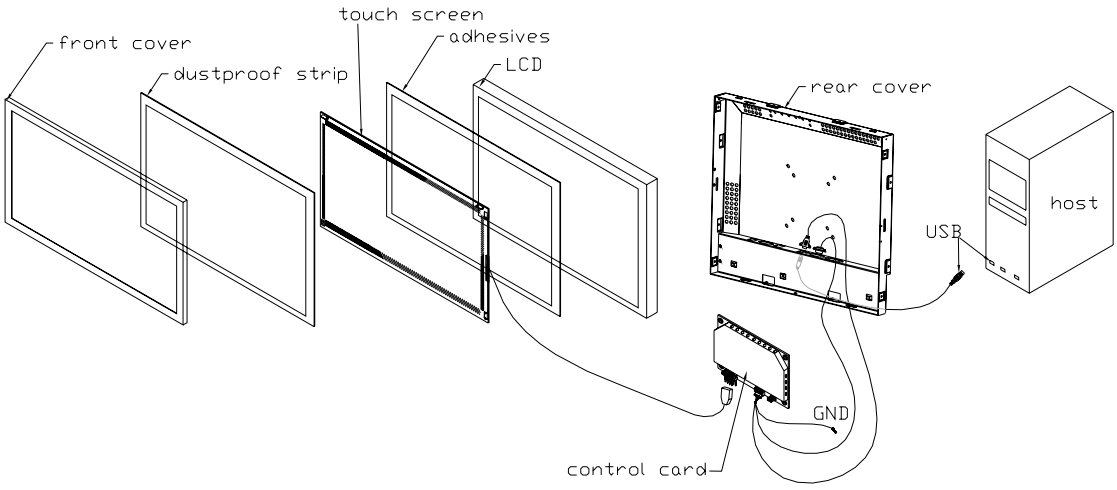
2 · Connect dual connector cable 14-835-025 9 pin connector to 9pin connector of control card.

3 · Connect USB extending cable 14-219-150 male USB connector to female USB connector of dual connector cable 14-835-025.

4 · Connect USB extending cable 14-219-150 USB connector to PC USB port.

5. Connect dual connector cable 14-835-025 4pin connector to 5V power supply

6. Connect dual connector cable 14-835-025 GND connector to ground



USB cable connecting

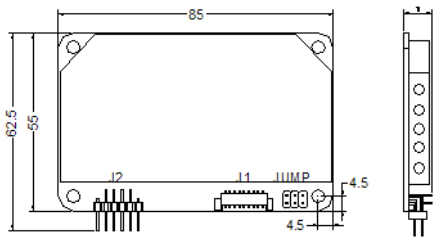
4 Physical Characteristics

Construction

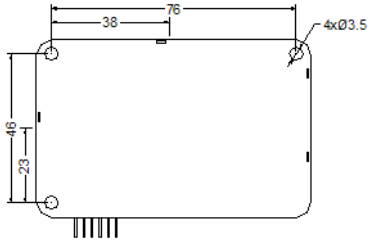
- Four-layer surface-mount design with internal ground plane for EMI suppression.

Dimensions

- Total width: 2.46 inches (62.5 mm), including connectors
- Total length: 3.30 inches (85 mm)
- Total height: 0.43 inches (11 mm)
- All mounting holes are plated through for chassis ground connection.



Top and Side View



Bottom View

5 Electrical

Supply Voltage and Current

- +5 VDC, nominal (+4.75 to +5.25 VDC)
- 85mA typical, 105mA maximum at +5 VDC. Typical power dissipation is 425mW at 5V.
- Minimum power-supply 200 mA.
- Inrush current of up to 600mA for 50mS.
- Total noise and ripple must be less than 100 mV (p-p) for frequencies below 1 MHz, and less than 50 mV (p-p) for frequencies above 1 MHz.

Serial Interface

- EIA 232E (Serial RS-232), DCE configuration. 8 Data Bits, 1 Stop Bit, No Parity, Full Duplex
- Hardware handshaking: RTS/CTS
- DSR is pulled HIGH (>+3V) by the 6020D when connected and powered. DTR can be asserted by the host to interrupt the flow of data from the controller.

Baud Rate

- 9600

USB Interface

- The 6020M controller is an interrupt-type, full-speed USB device.

Operating Modes

- Leadingtouch protocol
- Customer specific protocol
- Initial/ Stream/ Untouch Modes

Touch Resolution

- 4096x4096, size independent

Conversion Time

- Approximately 10 ms per coordinate set

Reliability

- MTBF greater than 1,543,000 hours per MIL-HDBK-217-F2 calculated by parts stress method in ambient environment.

6 Environmental

Temperature

- Operating: 0°C to 65°C
- Storage: -25°C to 85°C

Humidity

- Operating: 10% to 90% RH, noncondensing
- Storage: 10% to 90% RH, noncondensing

Operating Altitude

- 10,000 feet

Shock and Vibration

- The controllers, with Leadingtouch standard container, can meet International Safe Transit Association project 2A test procedure.

ESD: Controller Alone

- Per EN 6100-4-2 1995. Level 4
- Contact Discharge - 8kV
- Air Discharge - 15kV positive and negative polarity
- Applied directly to J2 and J1 Serial port via a 560 ohm resistor and a 10" wire
- J1 USB pins 6,7 and 8 are tested using an ESD generator equipped with a standard finger probe and set to 15kV. The ESD generator is applied to the series A receptacle at the host end of a 1m USB cable, which is plugged into the controller USB series B receptacle. The controller is powered up and grounded.

Table 1 J1 Pins for ESD Testing

J1 Pin	Signal Name	Signal Function	J1 Pin	Signal Name	Signal Function
2	CTS	Serial Port	4	TxD	Serial Port
3	RxD	Serial Port	5	GND	Ground

The controller may not function correctly after test, however, it should work normally after reset or recycle of the supply. The ESD tests will be conducted with the controller integrated into a monitor with the controller and the ESD generator grounded to the monitor chassis.

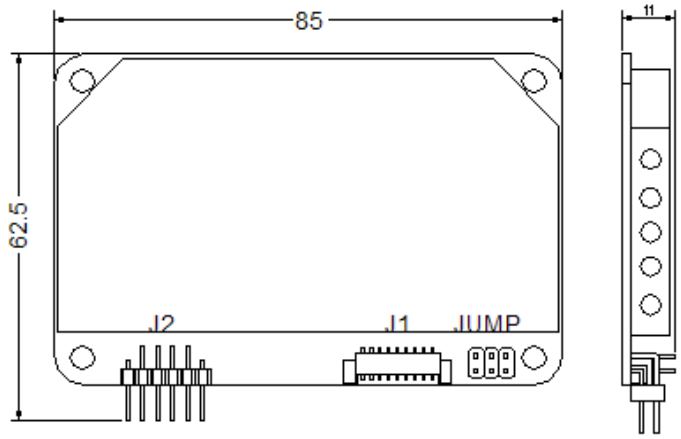
Flammability

- The PCB substrate is rated 94V0. All plastic components, such as headers and connectors, are also rated 94V0.

7 LED Indicators

The 6020M controller has one LED status indicators. When 6020M controller initially connects to host, the LED will be constantly on. Then when touchscreen connects to 6020M, the LED will snuff out after 3 seconds and be constantly on during touch.

8 Connectors and Signal Descriptions



CONNECTOR PIN DEFINITION

J1		J2 (SENSOR)	
PIN #	SIGNAL NAME	PIN #	SIGNAL NAME
1	GND	1	GND
2	CTS	2	NC
3	RXD	3	Y-R
4	TXD	4	Y-T
5	GND	5	Y-R'
6	N.C	6	GND
7	N.C	7	GND
8	5V	8	GND
9	N.C	9	X-R
		10	X-T
		11	X-R'
		12	NC

All connectors are located along one side of the controller. Connector descriptions and pin definition are as following sections.

Power/Interface Connector

The power/interface connector, J1, is a 2.0mm pitch 9 pin connector, intended to be used with single wired pins in a 9 pin header. The pins definitions are shown in Table 2.

Table 2 Power/Interface Connector J1 Pin definition

J1 Pin	Signal Name	Signal Function	J1 Pin	Signal Name	Signal Function
1	GND	Ground	2	CTS	Serial Port
3	RxD	Serial Port	4	TxD	Serial Port
5	GND	Ground	6	D-	USB D-
7	D+	USB D+	8	Vcc	+5V Power
9	-	Reserved			

Table 3 USB Interface on Connector J1, Pin definition

Signal Name	USB pin	J1 pin	Signal Function
Vbus	1	8	USB Power
D-	2	6	USB D-
D+	3	7	USB D+
GND	4	5	Ground

Table 4. Serial Interface on Connector J1, Pin definition

Signal Name	DB-9 pin	J1 pin	Sourced by	Signal Function
RxD	2	3	ctlr	serial data from controller to host
TxD	3	4	host	serial data from host to controller
CTS	8	2	ctlr	used as "ready to receive", handshake = '0' (POSITIVE) when host may send
SG	5	4	com	signal ground

Signal electrical characteristics are as below.

Table 5 Serial Signal and LED Electrical Characteristics

Parameter	Value	Signals
Minimum ON state input volts[1]	+3 volts	TxD
Minimum OFF state input volts[1]	-3 volts	TxD
DC Load Resistance	5 kΩ ± 2 kΩ	TxD
Source Impedance (Power Off)	> 300 Ω	RxD
Output Voltage, Open Circuit	25 volts, max.[2]	RxD, CTS
Output Voltage into test load[3]	>5, <15 volts[2]	RxD, CTS
Short Circuit Current	<100 mA	RxD, CTS
Transition Characteristics	per EIA-232-E [4]	RxD, CTS
External LED short circuit current[5]	0.5mA nominal	LED

[1] Measured with respect to circuit AB, Signal Ground.

[2] Absolute magnitude.

[3] Output voltage measured over the entire range of test load from 3000 ohms to 7000 ohms.

[4] The transition characteristics comply with ANSI EIA/TIA-232-E while the controller is powered on; during power up and power down some of the criteria will not be met.

[5] LED cathode drive is through 1kOhm to ground. Connect the anode to controller +5V supply.

Touchscreen Connectors, J2, and Signal Descriptions

The touchscreen connector, J2, is a dual row by six position header with 0.025 inch square pins spaced on 0.100 centers.

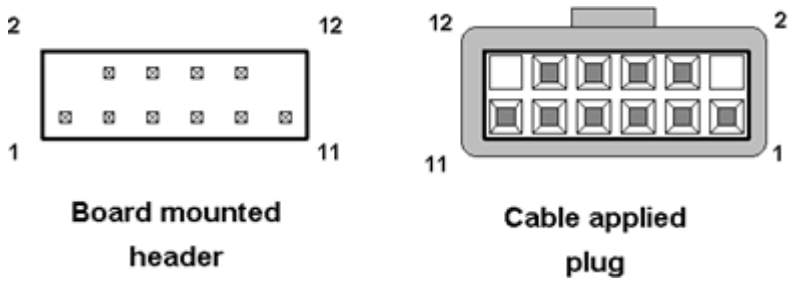


Figure 1 Pin Diagram for Touchscreen Connector, J2

Table 6 Touchscreen Connectors, J2, Pins definition

Signal name	J2 pin	Signal function
Chassis	1	frame ground for cable shield
none	2	connector key
Y rcv +	3	Y+ receiver
Y xmt +	4	Y+ emitter
Y rcv -	5	Y- receiver
Y xmt -	6	Y- emitter
analog gnd	7	analog ground
X xmt -	8	X- emitter
X rcv -	9	X- receiver
X xmt +	10	X+ emitter
X rcv +	11	X+ receiver
none	12	connector key

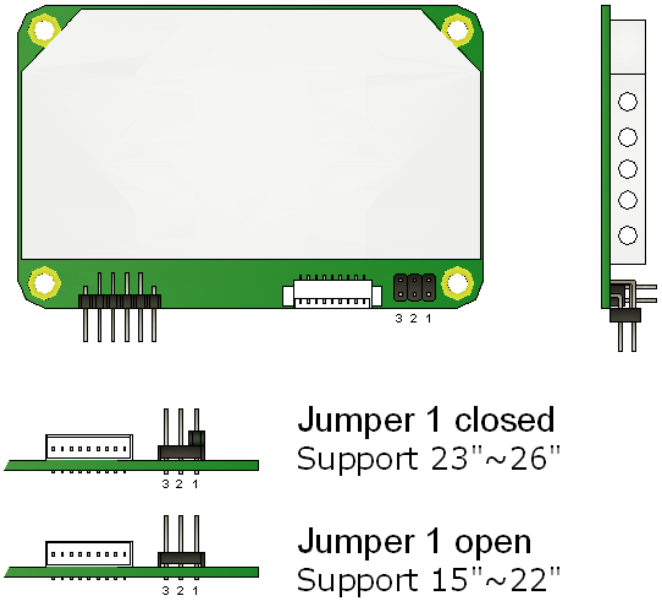
9 Agency Approvals

The touch system including 6020M controller, touchscreen and connection cable has certified with FCC Part 15.

The touch system including 6020M controller, touchscreen and connection cable is compatible with EN55022 and EN55024 standards and is certified with CE.

10 Jump Setting

6020M has 3 jumps, enabled by placing shorting jumpers on specific jumper headers as shown below or disabled by leaving the locations open to support different driver mode and touchscreen sizes:



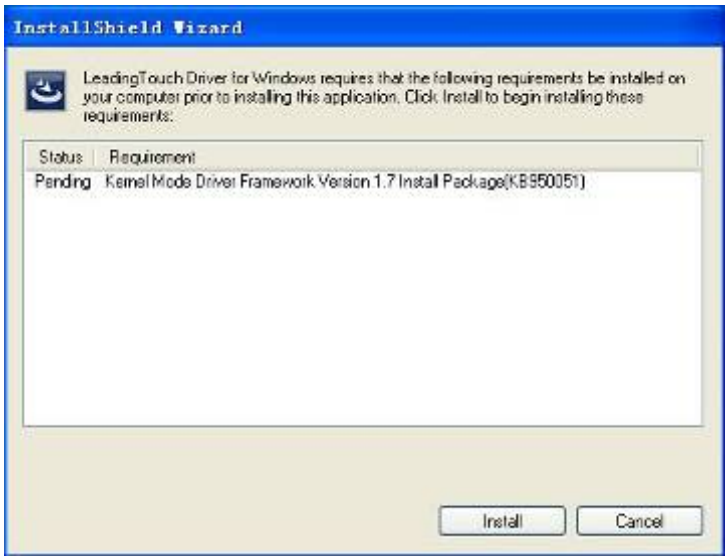
LeadingTouch 6020M Controller Jump Setting		
JMP1 **Control Touch Panel Size**	Open	Support 15"~22"
	close	Support 23"~26"
JMP2 **Control Touch Panel Size**	Open	Reserved
JMP3 **Control Drivers supports**	Open	Support LeadingTouch Driver
	close	Reserved

11 Installing Driver

Start installation

Double click setup.exe file to start installation.

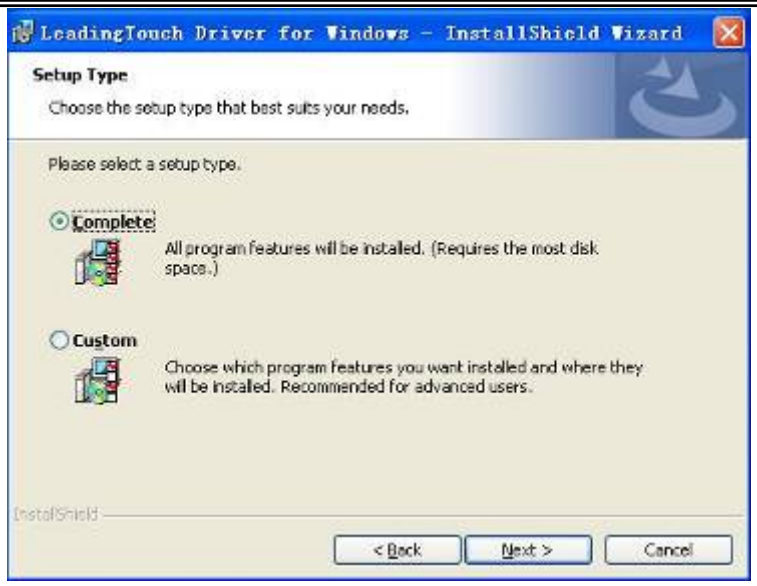
Firstly install resource kit for driver


InstallShield Wizard
LeadingTouch Driver for Windows requires that the following requirements be installed on your computer prior to installing this application. Click Install to begin installing these requirements:
Status
Requirement
Pending
Kernel Mode Driver Framework Version 1.7 Install Package(KB950051)
Install
Cancel

Choose a installation path, the default path is C:\Program files\Leadingtouch.

LeadingTouch Driver for Windows - InstallShield Wizard
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install LeadingTouch Driver for Windows to:
C:\Program Files\LeadingTouch\
Change...
InstallShield
< Back
Next >
Cancel

There are two setup type: complete and Custom. The default one is complete type.


LeadingTouch Driver for Windows - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

After installation, double click LeadingTouchSetup on desktop to enter calibration program.

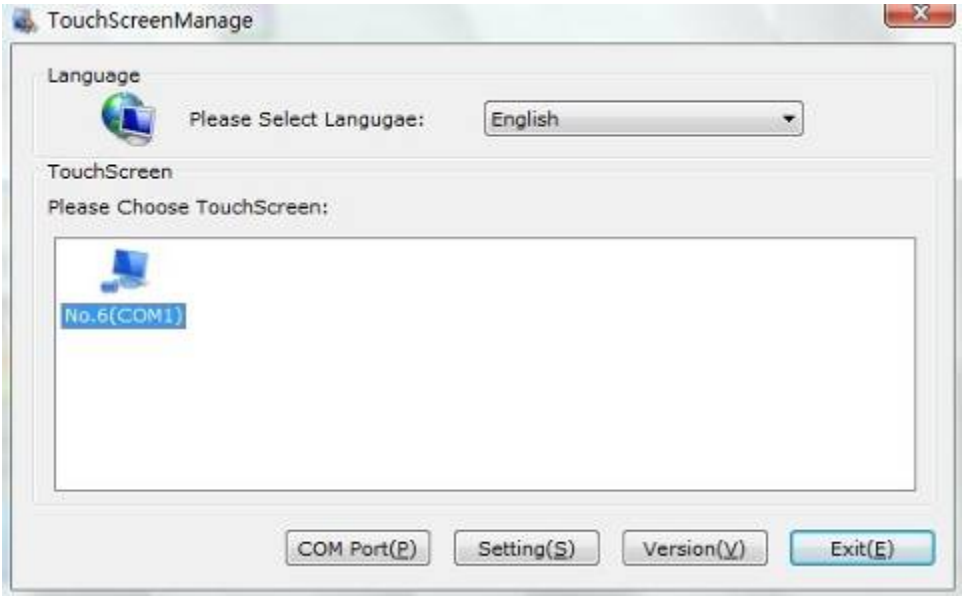
Introduction to driver setup and function

Touchscreen administration interface

Language: can choose interface language, now has two choice Chinese and English language.

Touchscreen: All touchscreen can be recognized is shown in the box, choose the right one calibrate and click Setting(S) to continue your setting.

COM Port(P): For serial interface touchscreen, please select the right COM port for your touchscreen to continue setting(Note: COM interface touchscreen can't not be recognized autoly, user need to select COM port manually and click Add to add touchscreen into computer as following picture shows).

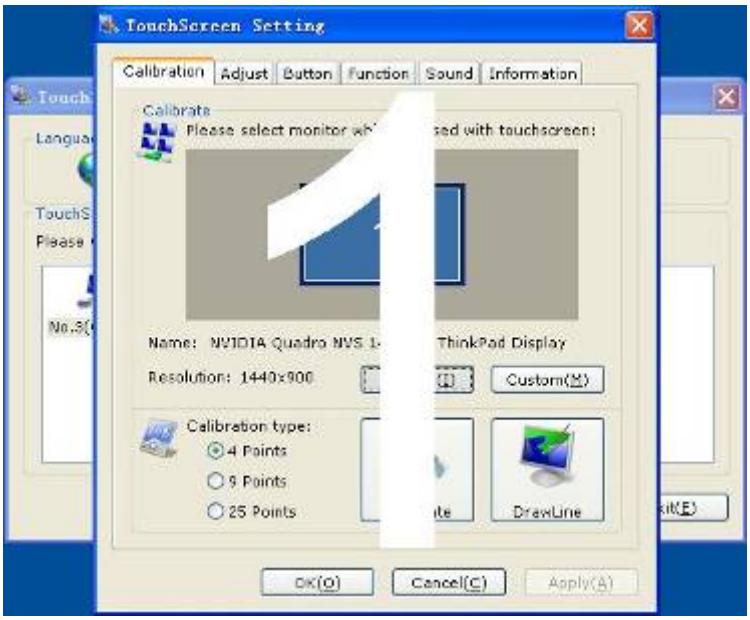


Driver version information

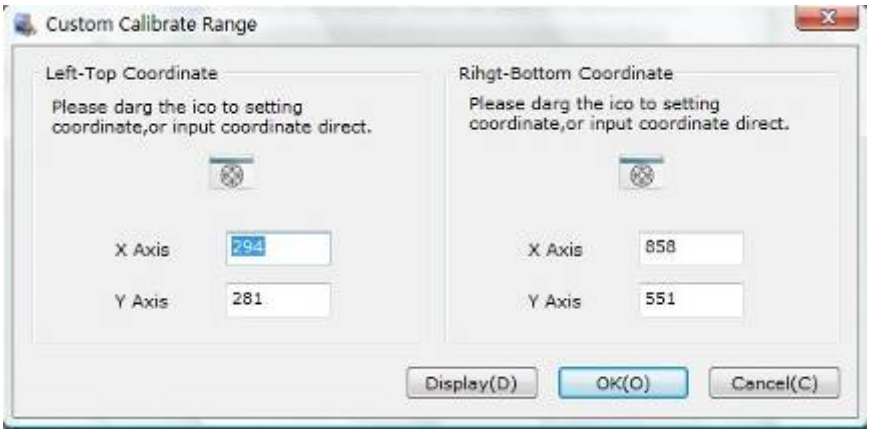
Touchscreen setting

Calibrate: show monitor and resolution information recognized by system

Identify: show monitor information to current touchscreen.



Custom: to define custom calibration area by changing drag Left-Top and Right-Bottom coordinate to set calibration area.



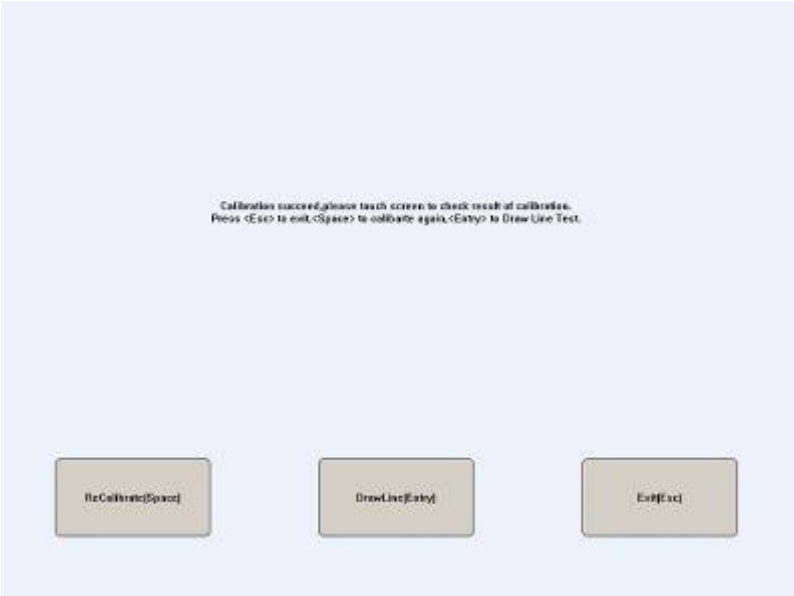
4 points calibration: calibrate by 4 points, for SAW and Infrared touchscreens.

9 points calibration: calibrate by 9 points, for 4W, 5W and capacitive touchscreen.

25 points calibration: calibrate by 25 points, for 4W, 5W and capacitive touchscreen.

Select 4 points, 9 points, 25 points or custom and click calibrate to start calibration.

Press the center of red point for about 2-3 seconds. Don’t release your finger until the red point shaft to next position or hearing beep sound. Repeat for all red point to finish calibration.

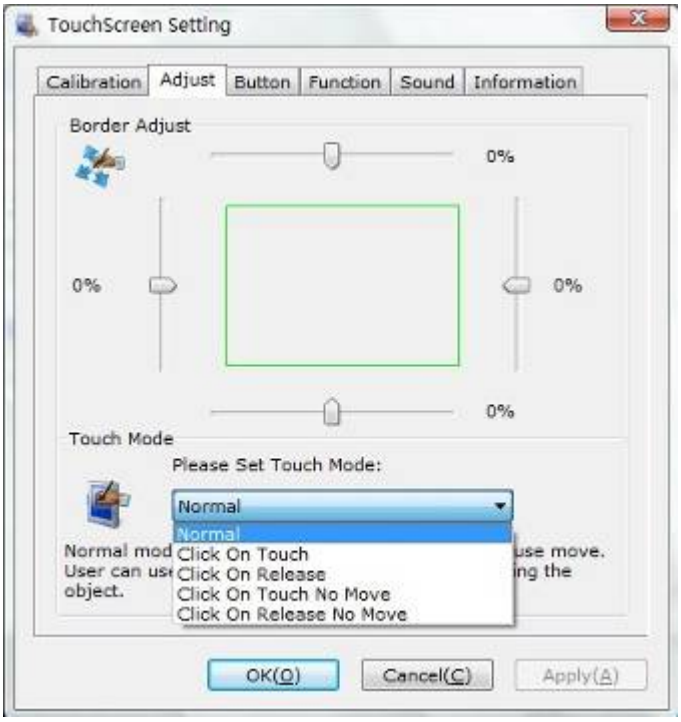


After calibration, you can choose:

Recalibrate: If mouse cursor can't overlap with your touch finger, please select this item to calibrate touchscreen again.

DrawLine: Select to enter draw-line test, for more details refer to next chapter

Touchscreen setting- Adjust



Border adjust: adjust screen border scale border to fit current touchscreen, as touchscreen may have abnormal action caused by installation or non-linear problem.

Touch mode:

Click On Touch: indicates the response when your finger touches on the panel

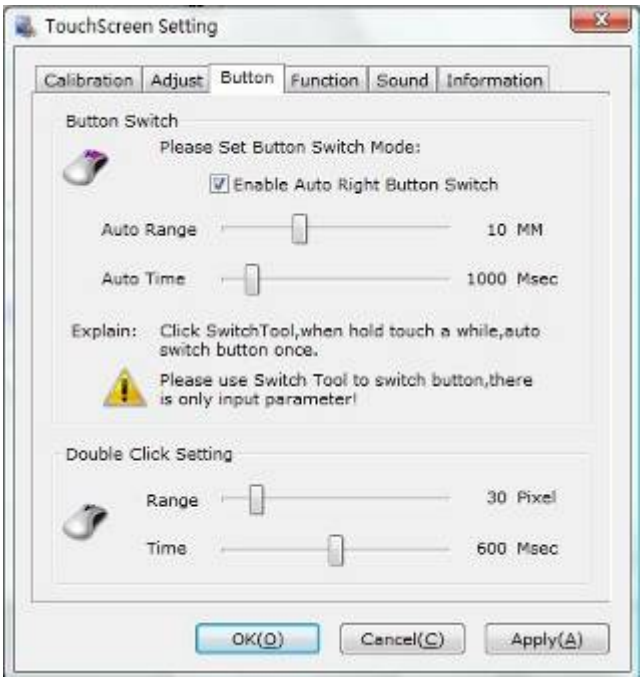
Click On Release: indicates the response when your finger leaves the touchs panel

Click On Touch No Move: indicates the response when your finger touches on the panel, can't draw

line and drag

Click On Release No Move: indicates the response when your finger leaves the panel, can't draw line and drag

Touchscreen setting-Buttom



[Button Switch]: Enable Auto Right Button Switch

Auto range: Click effectual in 10mm area

Auto time: Click effectual in 1000mMsec

Auto right button effects only when above two items effectual.

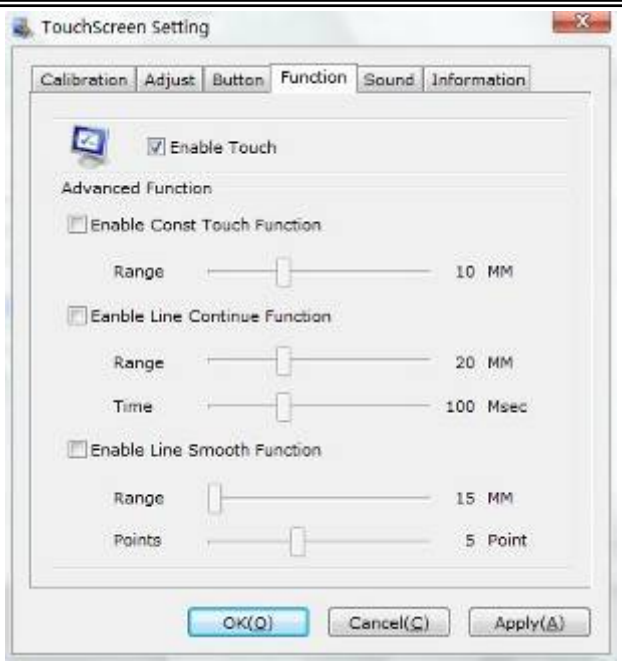
[Double Click Setting]:

Range: Clicks in range of 10 mm are determined to be a touch point

Time: Clicks in 500 msec are determined to be a touch point

If any icon or program can't open normally, please drag the two rules above to right side a little.

Touchscreen setting-Advanced



[Enable Touch]: Enable or disable touch function of touch panel

[Advanced Function]:

Enable Const Touch Function: The range of 10 mm are determined to be a touch point

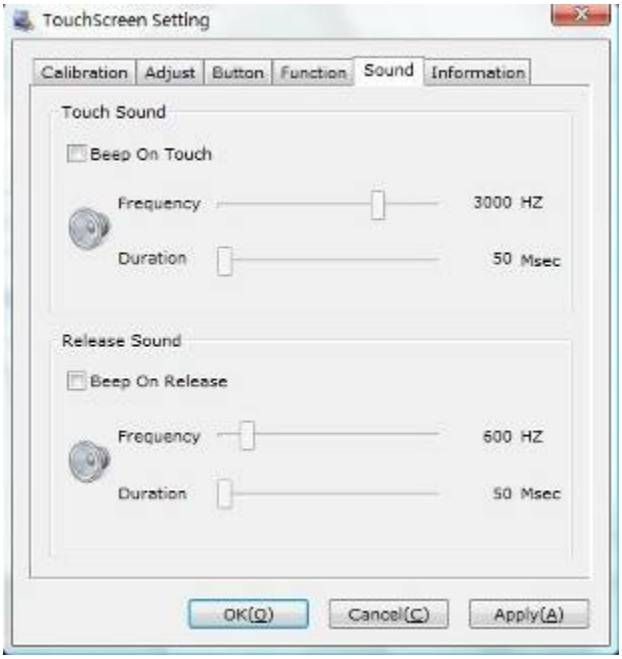
Enable Line Continue Function: Settings for handwriting input or drawing.

Range: Disconnected line in range of 20mm will be amended by algorithm

Time: Disconnected line in range of 100msec will be amended by algorithm

Enable Line Smooth Function: Line can be smoothed by algorithm to insert 5points in 15mm range

Touchscreen setting-Sound



Beep on touch the speaker on the computer will generate voice when touch on the touchscreen

Beep on release the speaker on the computer will generate voice when leave off the touchscreen

Touchscreen setting-Information

[Screen information]

Select: Click to select current touch panel size and model to amending function if mouse cursor not overlap with your finger after calibration. Default size is from 3.5inch to 42 inch

Custom: Click to input a custom touch panel size

[Control Card information]

Indicate Control Card information

Uninstall Leadingtouch drivers

Enter Touchscreen Uninstall program through the following programmer

1 Click "Start"----"programmer"----"Leadingtouch" ----"Uninstall"

2 Open control panel and select "Leadingtouch Driver for Window" ----"delete"

3. Run setup program and select “uninstall”.

11 FAQ

Q: Touchscreen no reaction. LED on control card is constantly on for 3 seconds, then snuff out and be constantly on during touch.

A: Phenomenon below indicates touchscreen and control card are in good condition, you can find out problem as below method.

1: if right driver is installed.
2：If COM port selected in program is the right one in use.
3：If Jumper on control card meet current driver.
4：If COM port of computer can work normally.
5：If computer COM port is in use by other device.
6：If there is any mistake information from operating system.

Solution:
1: Install a right driver
2：Set program COM port as the one in use. 3：Install a right driver. For jumpers and driver corresponding relationship please refer to Jumper setting description.
4：Inspect if Serial or USB port is open in mainboard bios file, if there is any hardware problem(can inspect by serial or USB interface mouth).
5：Change to another serial port or uninstall other device.
6：Change another host or re-install operating system.

Q: Touch no action and LED constantly on.

A: This indicate touchscreen and control card are not in good preparation, please check following below steps

1 : If space in monitor or cabinet for touchscreen is enough, transducers on touchscreen may be crushed.
2 : If protected film is tear off
3 : If reflection texture in touchscreen is dirty.
4 : If adopts wrong dust-proof strips or assemble it too tight.
5 : If Control card temperature is too high.
6 : If 12pin cable, signal cable on touchscreen, or control card is broken.

Solution
1 : Change another monitor, cabinet or touchscreen.
2 : Tear off protected film
3 : Clean touchscreen
4 : Adopts right dust-proof strips and assemble them not too tight.
5 : Remove control card to ventilated environment
6 : Change another touchscreen or control card.

Q: Touch no reaction, LED flickers.

A: That indicate a communication mistake between touchscreen and control card. Please settle it as following steps

1 : Check if power supply for control card is unstable.
2 : Check if there is water or other dirty on touchscreen.
3 : Check if cable connected to touchscreen and control card is loosing.
4 : Check if touchscreen and control card is broken.

Solution :
1 : Change another host or adopt a stable power.
2 : Clean touchscreen and restart computer.
3 : Re-connect touchscreen and control card.
4 : Change another touchscreen or control card

Q: Touch no reaction, LED is off constantly.

A: That indicate there is no current through control card. Please check as following steps.

1 : Check if 232 or USB cable is not in good condition or connection.

2：Check if power cable is not in good condition.

3：Check if control card is not in good condition.

Solution

1：Re-connect cable or change another cable

2：Change another power cable

3：Change another control card

Q: Cursor not move with finger, has deviation.

A: This is caused by inaccurate calibration, please check according to following directions.

1：Check if calibrate touchscreen uncorrectly.

2：Check if changed resolution without re-calibration

3：Check if jumper setting on control card meets current driver

4：Check if touchscreen is dirty

5：Check if control card temperature is too high to work normal, and if there is influence from other high frequency device.

6：Check if touchscreen and control card is in good condition

Solution

1：Redo calibration test, be sure let your finger overlap with red circle center in calibration

2：Redo calibration test

3：Setup right jumper and driver and redo calibration

4：Clean touchscreen

5：Remove control card to low temperature and influence place

6：Change another touchscreen or control card

Q: Cursor jump all around during touch, LED flickers

A: The phenomenon seldom happen, you can follow below steps to solve it.

1：Check if use unqualified dust-proof strips to crush touchscreen reflection texture too tightly

2：Check if there is water or other contamination on touchscreen surface.

3：Check if control card temperature is too high to work normal, and if there is influence from other high frequency device.

4：Check if control card power supply is unstable

5：Check if touchscreen or control card is defective

Solution

1： Use qualified drst-proof strips and don’t assemble it too tight

2：Clean touchscreen

3：Remove control card to low temperature and influence place

4：Change another host or provide a stable power supply

5： Change another touchscreen or control card

Q: Cursoer can't move, LED flickers

A: This usually caused by software mistakes, please solve it as following instructions

1：Check if calibrate uncorrectly

2：Check if jumper setting on control card meets current driver

3：Check if there is water or other contamination on touchscreen surface, or host is hang over

4：Check if adopt unqualified dust-proof strips or assemble touchscreen uncorrectly.

Solution:

1：Redo calibration

2：Make certain driver is correct installed and redo calibration

3：Clean touchscreen and restart computer

4：Adopt qualified dust-proof strips and assemble it not too tight

Q: A band area in screen is no touch action or must touch with great stress.

A: That is a signal attenuation phenomenon in that area, may caused by improper assembly or dust.

1 Check if touchscreen and monitor front frame is separated by our dust-proof strips

2 Check if there is dust accumulated on touchscreen reflection texture

3 Check if touchscreen assembly is too tight to transmit signal

Solution

1 Adopt our dust-proof strips to separate touchscreen and monitor front frame

2 Clean touchscreen reflection textrue

3 Loosing touchscreen and monitor front frame

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